

Book Reviews

BIOARCHAEOLOGY: INTERPRETING BEHAVIOR FROM THE HUMAN SKELETON. By Clark Spencer Larsen. New York: Cambridge University Press. 1997. 461 pp. ISBN 0-521-49641-1. \$85.00 (cloth).

The term *bioarchaeology* first entered the anthropological literature applied to studies of animal bone from archaeological sites. It assumed its present exclusive reference to human remains in the late 1970s, following Jane Buikstra's discussion of a novel conjunctive approach which she termed "bio-archaeology": "a new form of regionally-based, interdisciplinary research in mortuary site archaeology and human osteology . . . with the active participation of both archeologists and physical anthropologists in all phases of research design" (Buikstra 1976:69). As this masterful survey volume attests, Buikstra's call for scientific investigations which dynamically integrate human biological and cultural variables within specific environmental contexts has been well answered, to the enormous enrichment of anthropology as well as to such related fields as economics, history, and nutrition science.

Since the early 1970s, Clark Spencer Larsen's own bioarchaeological research has focused on the successive biocultural adaptations of Native American populations, beginning some 1,500 years ago, in the Western Great Basin and along the south Atlantic coast of North America known as La Florida by its sixteenth-century Spanish conquerors. His numerous solo and coauthored publications illustrate the rich rewards yielded by the conjunctive bioarchaeological approach: a well-rounded reconstruction of Native American life-ways which "fleshes out" bare-bones biological data with a wealth of contextual information from archaeological, historical, and ethnographic sources.

In the Introduction, Larsen states concisely his unifying theme: "*behavioral inference*" from human remains "considered in a

wider perspective" (p. 5). His comment that "A book like this would not have been possible prior to the last decade or so" (p. 3) reflects his explicitly population-based perspective towards analyses of past human behavior. Although he notes that "individual-based case studies are discussed, especially because they help build a picture of biological variability in earlier societies" (p. 3), his major focus throughout the volume is on old and new analyses which examine demographically representative population samples, chosen precisely because they yield so much more information about "the fabric of the human condition" (p. 3).

The first substantive chapter, "Stress and Deprivation During the Years of Growth and Development and Adulthood," states its purpose in its opening sentence: "Physiological disruption resulting from impoverished environmental circumstances—'stress'—is central to the study of health and well-being" (p. 6). Larsen begins with a review of studies of skeletal and dental growth and development, including both broad measures of health (growth rates, adult stature) and specific skeletal features (cranial base height, pelvic morphology, long bone diaphyseal form, and vertebral neural canal size) whose relationships to normal physiological functions are only apparently arcane. He then moves to considerations of malformed tissue: dental and skeletal defects (skeletal hyperplasia, growth arrest lines, enamel macro- and microdetects) from specific (e.g., iron deficiency) or systemic inadequacies. The section subtitled "Stress Histories in Human Populations" provides a fine capsule survey ranging from Krapina Neanderthals to late twentieth-century developing nations. Certain physiological problems such as osteoporosis that currently preoccupy aging USA baby boomers are discussed as perennial dilemmas in human biophysical adaptation; modern scientific knowledge of beneficial diets and activity patterns seems overruled by our desire for labor-saving devices, to our universal detriment.

The chapter titled "Exposure to Infectious Pathogens" begins and ends with discussions of skeletal evidence for four specific infectious diseases, the first (dental caries) being represented in all human (and indeed, prehuman) populations and the others (treponematoses, tuberculosis, and leprosy) being more geographically and temporally restricted. In the intervening section on nonspecific infection, that term does *not* imply that no specific pathogen can ever be identified in modern clinical cases of the different categories of bone reaction provoked (periostitis, osteitis, and osteomyelitis) but rather that specific pathogen identification is not possible for paleopathological cases. Larsen notes that nonspecific infection analysis provides only a "rather incomplete and undiagnostic picture of a population's disease history" because the associated pathogens and other stimuli (such as trauma) are so universally distributed, and he stresses that "Infection by a pathogen does not always result in disease" (p. 64), discussing the importance of social and environmental constraints on both nutrition and exposure.

In the following chapter, "Injury and Violent Death," the cultural context of bioarchaeological research assumes a crucial importance since so many types of injuries result from inimical social interactions, and their prevalence within a population may shed valuable light on social variables such as the status of children and women, relations among intracommunity social classes, and methods of warfare. Larsen discusses the frequent misinterpretation of certain injuries (such as Colles' fractures) as inevitably violence-related when in fact they may have often been accidental. Fascinating sets of case studies on Shanidar Neanderthals and Nubians in the ancient Sudan each provide new insights on the supposedly nasty, brutish, and short lives of premodern populations. The section "Intentional Injury and Interpersonal Violence" reviews the widespread (but not ubiquitous) pre-Columbian evidence for scalping in the US Southeast, Midwest, and Great Plains and the highly controversial alleged evidence for cannibalism in the prehistoric Southwest; it

also includes discussions of ritualized violence in prehistoric South American, Australian, and the South Pacific societies. Bioarchaeological analyses of skeletal series from northern Europe (Wisby in Denmark, Romano-British and Anglo-Saxon sites in Britain), New World colonies in La Florida and the Southwest US and military sites throughout North America reveal details of common battlefield injuries and their surgical and medical treatment.

Two chapters are devoted to "Activity Patterns," the first dealing with skeletal modifications in joints and areas of muscular attachments and the other with structural adaptations primarily affecting the morphology of long-bone shafts. Skeletal markers and population patterns of age- and activity-related osteoarthritis are distinguished from those of rheumatoid arthritis and other similar disorders, and the effects of specific habitual behaviors (e.g., squatting, use of the atl-atl or mano and metate) upon muscular and therefore skeletal development are nicely outlined. The detailed discussion of skeletal response to a wide variety of mechanical demands clearly reflects Larsen's ongoing interest in this particular behavioral indicator, evidenced by his long-term collaboration with the skeletal biologist Christopher Ruff. Both chapters present numerous Old and New World case studies spanning Neanderthal to modern times.

The following chapter, "Masticatory and Nonmasticatory Function: Craniofacial Adaptation," continues this theme. Over the past 10,000 years, human diets worldwide have become progressively softer in texture and higher in starches and refined sugars. The biological consequences of these changes include a rise in caries rates, decreased abrasive wear, and subtle modifications in cranial shape attributed to decreased mechanical action of the muscles involved in chewing. Specific damage to the dentition from nonalimentary uses of the teeth as tools to hold fibers in weaving, chipping stone knives, and splitting cane for basketry are also described.

New tools in the anthropological study of past diets form the subject of the next chapter, "Isotopic and Elemental Signatures of

Diet and Nutrition." Traditional examinations of skeletal and dental tissues focused on the pathological consequences of certain dietary regimes (e.g., dental caries, skeletal markers of iron-deficiency anemia, rickets, etc.), but the new techniques target chemical composition of the dietary components themselves: carbon, nitrogen, and a host of trace elements. Larsen cautions against simplistic equations of specific chemical signatures with specific diets, noting that accurate anthropological interpretations of, for example, high concentrations of strontium in bone tissue would differ for coastal vs. inland populations.

Passing from Larsen's detailed discussion of the new synthesis between macroscopic and chemical analyses for dietary reconstruction to his penultimate chapter, "Historical Dimensions of Skeletal Variation: Tracing Genetic Relationships," we are surprised to find DNA studies relegated literally to the last paragraph (albeit with a hopeful note that the new technique will probably reverse the recent decline in research emphasis on biodistance studies). His examples of biodistance analyses based on skeletal and dental morphology and metrics are, as always, well chosen; some focus on comparisons of different population samples, and others investigate intragroup genetic relationships within social-network frameworks such as postmarriage residence patterns.

In his final chapter, Larsen considers changes and challenges in bioarchaeology. In the preceding chapters, he has offered the reader ample evidence that the lament voiced in 1982 by a prominent group of skeletal biologists that "human osteology has been and continues to be dominated by an overriding concern for the description of biological differences between populations" (p. 333) cannot now be reasonably applied to the discipline of bioarchaeology. A much-needed paradigm shift has indeed occurred, and researchers now focus on functional interpretations and engage in conjunctive research with ethnologists instead of being obsessed with anatomical descriptions (which, in all fairness, few were in 1982). Larsen cites three major issues with complex and significant implications for the future of his disci-

pline: "(1) the degree to which human skeletal remains represent the populations from which they were drawn, (2) standardization of data collection, and (3) the future of skeletal studies in the light of new developments in repatriation and potential loss of data" (p. 334). As he notes, current theoretical perspectives on analysis of growth patterns, estimates of fertility, and the complex relationships between skeletal morbidity and mortality (the osteological paradox) have dramatically matured in sophistication just at a time when the claims of indigenous and religious groups for return of curated skeletal collections threatens to put an end to such inquiries. Indeed, this has already happened in some places, and antiskeletal research arguments seem to be gaining momentum worldwide. In the United States, federal repatriation legislation (NAGPRA) is prompting (and sometimes forcing) a new climate of communication between anthropologists, museum curators, and native peoples, and considerable potential for fruitful collaboration exists. Larsen ends his book on a hopeful note: "The chance is now at hand for sharing this information [derived from skeletal studies] widely, especially regarding the large and crucial part that human biology and bioarchaeology play in understanding the history of the human condition" (p. 342).

Larsen notes that this book is not a manual of human osteology, nor is it "methodologically driven" (p. 3), although he does discuss some specific methodological developments (e.g., trace element and stable isotope analyses) which make possible increasingly sophisticated queries and answers. He clearly states, "This book is intended to feature *the various insights gained about human behavior and biology rather than to evaluate specific methods and techniques of skeletal analysis* [emphasis added]. . . . It is not a critical review; it does not highlight the shortcomings of the field or what bioarchaeologists should be doing, but are not" (p. 4). The omission of a chapter dealing with paleodemographic analysis may seem strange to some readers, considering that mortality profiles are such stark measures of a population's successful survival. How-

ever, Larsen discusses several major theoretical issues in paleodemography in his concluding chapter and refers the interested reader to numerous demographically focused studies, probably the best choice in view of the topic's complexity. The volume has been carefully produced and is well illustrated with numerous black-and-white photographs and graphics. Larsen's decades of scholarly experience have given him a firm command of the worldwide bioarchaeological literature: the 88 page bibliography contains some 1,700 references spanning more than a century, all of them representing serious (if not always successful) inquiries into past human biocultural adaptation. My only reservation about the volume is its price: not outrageous or unjustified to be sure, but unfortunately almost out of the range of student pocketbooks; this will probably limit its use in undergraduate courses.

However, it is an absolutely *required* acquisition for any scholar, library, or laboratory with a serious interest in anthropological reconstructions of human life in the past. Happily, the days of dry-as-dust skeletal appendices limited to long tables of uninterpreted measurements and photographs of interesting skulls, reluctantly included as afterthoughts to the real material of archaeology (pots and points), are clearly over, and long may they resquaint in pace!

MARY LUCAS POWELL
Department of Anthropology
University of Kentucky
Lexington, Kentucky

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TOOTH ENAMEL MICROSTRUCTURE. Edited by Wighart von Koenigswald and P. Martin Sander. Rotterdam: A.A. Balkema. 1997. 280 pp. ISBN 90-5410-667-0. \$95.00 (cloth).

Enamel is the hardest and stiffest material in our bodies. As a result, it is also the most commonly preserved material in our fossil record. Spawned by these facts, recent advances in the study of genetics, embryology, development, microscopy, and biomechanics have left enamel in a position of great importance in the study of primate paleobiology. Not surprisingly, then, there have been a number of recent books focusing on the study of teeth. However, these have been either general summaries of information (e.g., Hillson, 1996, Scott and Turner, 1997) or edited volumes with other foci (e.g., Lukacs, 1998). Until now, nothing has summarized state-of-the-art research on enamel. This volume is an initial attempt to do so. It is the result of a workshop held in Andernach/Rhine, Germany, on July 24-28, 1994. Twenty-five researchers participated in the workshop, and 16 eventually contributed to

the 15 chapters in this book. The chapters were broadly conceived to cover the major fields of current enamel research, and they are organized around Koenigswald and Clemens's (1992) well-known hierarchy of enamel microstructure, moving from chapters on the crystallite and prism levels on through chapters on enamel types and on the schmelzmuster and dentition levels (i.e., the spatial distribution of enamel types within the crown of a tooth or within different teeth, respectively). As is so often the case with this publisher, the illustrations, particularly the scanning electron microscopy micrographs, are exquisitely done. Thus, the relatively high cost of the volume might well be justified by that fact alone. Another major strength of the volume, however, lies in the general nature of the topics covered by some of the authors. Admittedly, there are no chapters focusing specifically on primates, and, as with many edited volumes, some of the contributions have a very narrow focus, but there are also some *excellent* reviews of important topics in enamel research. This is all followed by the editors' glossary of terms at the end of the